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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE



Praying Mantis

See Page 173

A SCIENCE SERVICE PUBLICATION

MEDICINE

Improved TB Recovery

Combination of modern anti-tuberculosis drugs and new knowledge of how best to combat the germ improves the outlook for recovery from the white plague.

► **TUBERCULOSIS PATIENTS**, both those returning from Korean POW camps to Army hospitals and civilians battling the white plague, can be given a better outlook for recovery, thanks to new methods for treating the disease.

The improved outlook does not depend alone on the modern TB-fighting drugs, though those play an important part. It comes also from new knowledge about the germs and new understanding of what the patients need to get them well.

Out in Denver, for example, doctors at the National Jewish Hospital are getting TB patients out of bed much earlier, in from eight to 10 weeks in some cases. They plan, however, to keep these patients in the hospital longer, for 16 to 18 months.

When these patients leave the hospital, they will be able to work an eight-hour day and engage in such leisure time activities as moderate dancing, bowling and even some swimming. On the former treatment schedule, calling for longer bed rest but getting out of the hospital in 10 months, patients were able to work only four hours a day and from 15 to 20 percent of them broke down and had to return to the hospital. Such breakdowns will not happen when the patient leaves the hospital under the new treatment schedule, the doctors believe.

The longer time spent in the hospital, but out of bed, will give them a chance to brush up on old skills or learn new ones so they are able to go back to earning a living.

Isoniazid, or INH for short, is the drug used for these patients. This new TB-

fighter is being widely used at various institutions for treating patients with TB.

This and other anti-TB drugs, however, can be used more effectively if doctors take advantage of new knowledge about the germ and its resistance to drugs. Such resistance is a matter of the germ's genetic constitution, not of contact with the drug. Some germs are born genetically constituted to have resistance to INH or other drugs, just as some people are born genetically constituted to have blue eyes. When INH or other drugs kill the non-resistant TB germs, those with resistance bred in them by natural processes can persist and breed more of their kind. Knowledge of this genetic factor comes from research by Dr. Vernon Bryson of the Biological Laboratory at Cold Spring Harbor, N. Y.

To take advantage of this situation, doctors should treat tuberculosis by hitting the germs hard right from the start, Dr. Edwin J. Grace of the Grace Clinic, Brooklyn, N. Y., says. He advises giving all three modern anti-TB drugs, INH, streptomycin and PAS (short for para-amino-salicylic acid), in large doses from the beginning, and in giving them by every possible route. For lung infections he says the drugs should be given in vapor inhalations, to get at the germs in the lungs, as well as by injection or by mouth to reach the germs through the blood stream.

With this new system, he found he could cure 12 out of 14 patients in eight to 12 months in office treatment, instead of having the patients in hospitals.

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MEDICINE

Stop Jaundice Spread

► **ONE IMPORTANT** disease-fighting action of gamma globulin has been almost completely overshadowed this summer by its wide use for fighting infantile paralysis.

Ever since 1945 scientists have known that this blood fraction could protect against infectious hepatitis, or jaundice as the layman calls it. And in spite of the demand for G.G. for polio, some of the nation's supply was reserved for use in preventing hepatitis and modifying measles.

Fresh reports of this hepatitis-fighting action of G.G. came from Drs. Benjy F. Brooks, David Yi-Yung Hsia and Sydney S. Gellis, all associated with Harvard Medical School here. In a study of 81 families in the Greater Boston area, they found G.G., in doses one-fourteenth as large as

used for polio fighting, would protect members of a family from hepatitis that had attacked one member.

In families not given G.G. after the first member got sick with yellow jaundice, 48% were attacked, with 35% of the exposed children being stricken.

The great menace from yellow jaundice, or infectious hepatitis, is in the highly fatal cirrhosis, or permanent liver damage, that may result from it. Adults, especially those under 30 years of age, and those with chronic illnesses, appear to be particularly likely to develop this complication. Children, suffering from other illnesses which tend to lower their resistance, are prime yellow jaundice victims and should be protected, the doctors point out.

Gamma globulin is especially indicated for pregnant women who are exposed to yellow jaundice, since they are highly susceptible. Expectant mothers also tend to get the disease more severely and go into labor prematurely. Thus, their protection is doubly important since one-half of infant deaths during the first 30 days of life are due to prematurity.

The studies were made at the Children's Medical Center and Beth Israel Hospital, with the aid of a grant from Playtex Park Research Institute. They are reported in the *New England Journal of Medicine*.

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CHEMISTRY

Insecticide Cleared Of Poison Charge

► **THE INSECTICIDE**, chlordane, now seems cleared of the charge of being poisonous to warm-blooded animals through experiments by Dr. L. Ingle of the University of Illinois.

The poisoning of pigeons and mice reported by some scientists as a result of breathing chlordane vapor, Dr. Ingle finds, was due not to chlordane, but to another chemical that was in some of the chlordane when it first was manufactured several years ago.

This chemical, an unreacted ingredient, is hexachlorocyclopentadiene. This ingredient has now been reduced in chlordane manufactured today to a point where there is no longer enough of it to produce "significant" vapor poisoning of mice, Dr. Ingle reports in *Science* (Aug. 21).

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PHYSICS

Indium Makes Solder For Many Materials

► **BECAUSE IT** sticks tightly to many metals and non-metals, indium, a soft silvery metal, is a versatile solder useful in laboratory and industry. Prof. Richard B. Belser of Georgia Institute of Technology reported to the American Physical Society meeting in Albuquerque, N. M.

Melting at the relatively low temperature of 155 degrees Centigrade, or 311 degrees Fahrenheit, indium has the dual ability of adhering to many metals when molten and continuing to stick to them upon solidification. Indium has been thus joined with 24 metals and 18 non-metals, including common industrial metals, glass, ceramics, quartz, mica, metallic oxides and silicious minerals.

Fluxes are not needed and actually prevent the soldering effect. Prof. Belser suggests that alloys with small percentages of silver and larger percentages of lead and tin will be useful for mechanical use, electrical connections, soldering to thin metal films, mounting piezoelectric crystals and sealing glass to metal.

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PHYSICS

Powerful Atom Smasher

Plans for 15-billion-electron-volt accelerator, a "colossatron," are now being circulated. The proposed machine will develop five times as much energy as now available.

► THE WORLD'S most powerful atom smasher, a 15-billion-electron-volt "colossatron," can be built in about three years for \$6,000,000 to \$8,000,000.

Plans for the new giant atomic accelerator, which will mimic under man's control some of the power unleashed by cosmic rays, are being circulated among scientists for criticism by the design group headed by Dr. M. S. Livingston of Massachusetts Institute of Technology.

The proposed instrument, which the Atomic Energy Commission is being asked to build, uses the new, strong focusing principle worked out last year by a group of U. S. scientists. This will allow the "colossatron" to develop five times as much energy as the present world's largest atom smasher, the cosmotron at Brookhaven National Laboratory on Long Island, with an outside diameter of 75 feet.

The strong focus is developed by using many small magnet sections, rather than the larger ones now common, to focus the whirling atomic particles. The 15-billion range was chosen by the Cambridge Design Study Group, composed of scientists at Harvard University and MIT, because unleashing such energies would enable scientists to delve deeper into the heart of matter under conditions controlled by man.

The powerful cosmic rays bombarding earth from outer space have energies ranging from about two billion to several thousand billion electron volts. Where and when they strike, however, is not predictable, and their tracks are caught on photographic plates sent 20 miles or so above the earth only by chance. So to get a better picture of the atom, man is building more and more powerful atom smashers.

The cosmotron has operated at 2.3 billion electron volts, and is expected some day to reach 3 billion, at the very lowest level of cosmic ray energies.

Officially, the proposed 15-billion-electron-volt machine is known as an "alternating gradient focusing synchrotron." The strong focusing idea was worked out last year by Drs. Livingston, Ernest D. Courant, Harland S. Snyder and John P. Blewett of Brookhaven, and was first suggested by N. Christophilos, a Greek citizen. By this method, the size of the magnet to accelerate to a given energy can be reduced very considerably, thus saving considerable metal, time and money.

The machine will speed up protons, the hearts of hydrogen atoms and one of the building blocks of all matter. They will circle in a thin-walled metal tube, oval-

shaped and only two by four inches in diameter. Diameter of the doughnut ring around which the cluster of protons is whirled would be 320 feet.

The ring consists of 48 sections of magnet, each 16 feet long, separated by gaps of five feet. Each magnet section has equal lengths of diverging and converging focusing fields. These magnetic fields act on the protons in much the same way that convex and concave mirrors, used alternately, act to focus light waves.

As the protons whirl around the circular path, electrodes, spaced 12 times around the ring, will kick the cluster to higher and higher velocities. Finally, as in all atom smashers, the protons will crash into the target under study.

The greater the energy of the bombarding particles, the more revealing such a smash-up is. By studying the disintegration products, scientists can learn new facts about the mysterious forces that hold atomic hearts together.

The U. S. scientists are cooperating closely with a European group known as

the Council for European Research, Nuclear, or CERN, which is making plans for a 30-billion-electron-volt accelerator, using the same principle, to be built in Geneva on a site already donated.

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AERONAUTICS

Stratojet Bomber Acts As Flying Filling Station

► THE U. S. Air Force has a "convertible" jet bomber. It can rain bombs upon the enemy, or it can deliver fuel to its fellow bombers while they are streaking to or from enemy territory.

Boeing's B-47 medium bomber has been successfully converted for aerial tanker duty, Air Force Air Research and Development Command headquarters in Baltimore report. The B-47 Stratojet can be converted under field conditions into an aerial tanker and can be switched back for bombing duty easily.

Using an adaptation of the probe-and-drogue in-flight refueling system, the bomber lowers a flexible hose with a funnel-like device called a "drogue" on its end. To refuel while flying, another Stratojet slips a probe-like tube into the dangling funnel. Then fuel is pumped from the tanker into the receiving bomber.

The refueling fixtures are installed in the tanker ship's bomb bay. Certain instruments are added to the cockpit to monitor the fuel transfer.



JET-POWERED TANKER—A Boeing B-47 Stratojet has been modified to make it an aerial refueling station, using a "probe and drogue" system. As shown in the photograph, the tanker airplane (right) trails a long hose, to the end of which is attached a funnel-like "drogue." The receiver airplane approaches the drogue, then engages the spear-like probe in its coupling mechanism, after which the fuel can be pumped.

The convertible B-47 is thought to be the world's first jet-powered aerial tanker. All production Stratojets are being equipped for refueling in flight. A demonstration of the aerial tank filling maneuver was given in Dayton at the National Aircraft Show.

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GENERAL SCIENCE

Fundamental Research Pledged to Agriculture

► MORE ADEQUATE support for research in the fundamental sciences upon which all of agriculture rests is advocated in a policy statement issued by Secretary of Agriculture Ezra Benson.

Such basic research has been the foundation of all the really big advances in agriculture, it is stated, and new research will be the source of new principles for the further improvement of our soils, plants and livestock.

The statement called for the strengthening of American agriculture through research and education. The system of co-operation between the U. S. Department of Agriculture and land grant colleges must grow to meet the growing demands of modern agriculture, it is emphasized.

Better organization and a more adequate extension program are contemplated. While improving marketing efficiency and gearing production to markets, it is planned to study more intensely the uses for millions of tons of agricultural products left on the farm and in marketing channels as waste, the statement said.

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PUBLIC SAFETY

Auto "Bug" Deflectors

► STATE LEGISLATURES are beginning to rule against the use of "bug" deflectors on automobiles on the grounds that they obstruct vision.

Connecticut motor vehicle authorities have outlawed the hood-mounted devices outright. New Jersey law says they are illegal unless completely transparent. Furthermore, they must not be larger than seven inches long and four inches high. Minnesota legislators enacted a law this year restricting the deflectors to a 50-square-inch transparent area.

Other states may follow suit on the gadgets which are said to throw insects over the car so they do not splatter on windshields. The American Association of Motor Vehicle Administrators favors restrictions similar to those of New Jersey.

Opaque "bug" deflectors mounted on the hoods of cars create blind spots. This is particularly true at night. Although the devices themselves may not be large, they obstruct vision in an ever-expanding cone as the driver scans the road ahead.

In this "dead" area of vision, a child may

VITAL STATISTICS

Biblical Lifespan Seen

► THE BIBLICAL lifespan of three score years and ten (70 years) will soon be the average lifespan in the United States, statisticians of the Metropolitan Life Insurance Company predict in New York.

They base their prediction on the record high longevity achieved by Americans in 1950 and the 21-year gain in average lifespan during the first half of this century, as shown by records of the National Office of Vital Statistics.

In 1950, the average lifespan of the American people reached 68.4 years. White girl babies born today can expect to live, on the average, 72.4 years. For white boy babies the figure is 66.6 years.

All white women 21 years old or older can expect, on the average, to live to be 75 years old before they die.

Among non-whites, expectation of life at birth is much lower. For males in 1950 it was 59.2 years and for females 63.2 years. Length of life on the average for non-whites in 1950 was practically identical with that for whites in 1937, the statisticians point out.

Further figures showing the improvement in longevity during the past half century are given as follows:

With the mortality conditions of 1900, only 66 out of every 100 newly born babies (without distinction as to sex or color) could expect to live to age 40. Their remaining lifetime then averaged 28.3 years.

Under mortality conditions today, the newborn baby's chances of survival to age

40 are 92 in 100 and expectation of life at that age is 33.1 years. In other words, those that survive to 40 years can expect to live another 33.1 years.

The chances of living from age 40 to age 65 have risen to 74 in 100, and those aged 65 now can expect, on the average, to live another 14.1 years instead of the 11.9 years they would have had ahead of them at the turn of the century.

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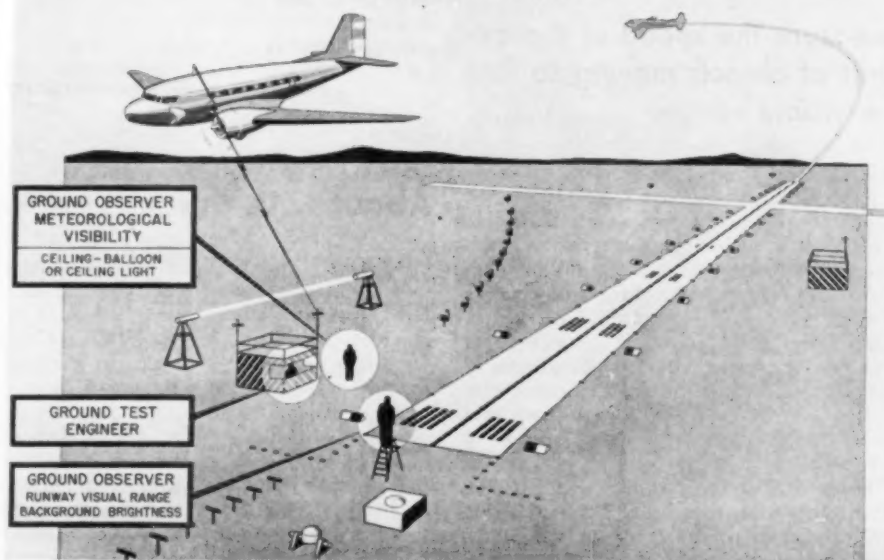
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ANDB-SPERRY-USWB LOW CEILING/VISIBILITY PROJECT GROUND TEST CREW STATIONS PRIOR TO START OF INSTRUMENT APPROACH



VISIBILITY INSTRUMENT LAYOUT—In addition to the instruments that measure visibility for landing aircraft, a weather observer climbs a step-ladder to approximate the cockpit height at "touchdown." He records the number of "targets" he can see along, and to the left side, of the runway.

METEOROLOGY

Bad Weather Landings

WEATHER AND aeronautical experts at MacArthur Field on Long Island, N. Y., are seeking a better way of predicting visibility conditions along airport approach paths.

The cause of many landing accidents has been traced to disagreement of visibility reported to the pilot by ground observers and the visibility the pilot actually encounters as he lands his plane, the Air Navigation Development Board reports. Rapidly changing weather and weather which changed after the last official observation have, in particular, been blamed for landing mishaps.

Working with the ANDB are the U. S. Weather Bureau and the Civil Aeronautics Administration. The project is being carried out under contract by the Sperry Gyroscope Co.

Special instruments were developed with the help of National Bureau of Standards scientists to measure visibility and have been installed at MacArthur Field. A ceilometer sweeps the skies every 12 seconds and determines the cloud ceiling near the approach end of the runway. (See SNL, May 9, p. 292.) A transmissometer measures the visibility on the ground continuously.

The transmissometer beams light to a receiving cell 750 feet away. The intensity

of the received light is translated into "percentage visibility."

Cameras in a test plane click pictures showing how the airport appears to the landing pilot. Ground-based tape recorders take down the comments made by the test plane's crew during the experimental runs.

To date, 151 foul weather air field test approaches have been made to gather data. Another 400 are scheduled to be made at weather ceilings of less than 500 feet.

Experts hope an analysis of the data will permit them to work out ways of giving pilots visibility information they need up to eight minutes before the landings are made. They also are considering the growing need of jet pilots who must have this information flashed to them as much as 20 minutes ahead.

The specialized equipment developed for the weather project already has proved valuable in helping to bring planes in to safe landings during bad weather. As a result, Idlewild, LaGuardia and Newark airports serving the New York area are to get similar instruments soon. Prototype equipment initially was put to work in December, 1952, at the Washington National Airport. During the following months it has helped reduce "overshoots" from eight to three percent on the instrument runway often used when visibility is less than a mile.

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TECHNOLOGY

Jet Pilot Clothing Tested for Suitability

CLOTHING FOR jet pilots, who at one minute may be sweltering in 160-degree cockpit heat and dunked into near-freezing waters of the Arctic Ocean the next, is being tested at the University of California at Los Angeles.

The project, supervised by Dr. Craig Taylor and Vincent Blockley of U.C.L.A.'s engineering department, is sponsored by the U. S. Air Force.

"The heat of friction and other factors in experimental jets have created a problem in the cockpit, where temperatures sometimes reach 160 degrees," pointed out Dr. Taylor. "Add to this the fact that many jet interceptors may be maneuvering over Arctic areas where their pilots must be protected from the eventuality of bailing out over icy waters or frigid wastes, and you have the problem."

The Air Force has suits for such eventualities: permeable, intermediate suits for the cold, and impermeable, heavy clothing to protect against prolonged immersion in water. The question is: can pilots operate efficiently in the suits in extreme cockpit heat?

U.C.L.A. engineers are testing such clothing in heated laboratory cockpits. Special heat meters wired in the suits measure such important factors as the amount of heat penetrating the suit from the outside, and how much clothing interferes with temperature regulating mechanisms of the body.

"Specially ventilated suits through which a stream of fresh, cool air is pumped, may be the answer to the problem," Dr. Taylor says.

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ENGINEERING

Remote Controls Give Orders to Power Plant

A CANADIAN power plant that works at the flick of a switch 72 miles away now is getting its finishing touches.

With its controls in Vancouver and its generators 72 miles away, the completed hydroplant will develop 82,000 horsepower for the British Electric Co., Ltd.

Although it can be operated at the plant, the Wahleach power station, as it is called, is designed to work with no attendants. "Automatic watchman" instruments carefully monitor the plant and are designed to shut it down if something goes wrong. Otherwise the plant takes its orders by remote control from engineers in Vancouver.

Technical details of the plant were described to the American Institute of Electrical Engineers meeting in Vancouver, B. C., by T. Ingledow and J. H. Steede, both of the British Electric Company.

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RADIO ASTRONOMY

Universe Expansion Rate

Radio astronomers may measure the speed of the expanding universe from the red shift of objects moving so fast their spectrum lines are not in the visible range.

► **HOW FAST** the universe is expanding may be answered by radio astronomers tuned in on the cosmic "noise" reaching earth from outer space.

Radio waves may be the only means by which the extremely high velocities of the ever-expanding, very far distant galaxies can be measured.

Astronomers find the rate at which the universe is expanding from the displacement in certain lines of the fanned-out light of receding galaxies. Just as the sound from a train whistle or an automobile horn is lower in pitch as the vehicle moves away from an observer, so the frequency of light waves shifts toward the red, or lower, end of the spectrum as the object emitting them recedes.

By measuring the amount of this shift, astronomers can tell how fast stars, nebulae or galaxies are dashing away from the earth.

So far as astronomers can now probe the outer reaches of space, they have found that the farther away the nebula, the faster it seems to be receding from us, as measured by the red shift. Velocities of 45,000 miles a second, or about one-fifth that of light, which travels 186,000 miles per second, have been found using the giant, far-seeing 200-inch telescope on Mount Palomar.

ZOOLOGY

Streamline Animal Naming

► **THERE ARE** new rules for name-calling among zoologists. These rules, the result of decisions at the International Congress of Zoology in Copenhagen, are designed to end confusion in the zoological literature through international agreement on the naming of certain animals.

Dr. J. Chester Bradley, president of the International Commission on Nomenclature and professor emeritus of entomology at Cornell University, has accepted the job of putting the new rules into workable order. His job will also be to streamline the old 1904 international code on zoological names with the Copenhagen rules. The new set of rules may be published in final form in about three years.

Dr. Richard Blackwelder, entomologist of the U. S. National Museum, who was a member of the U. S. delegation, explained that for a half a century there has been scientific dissension among zoologists over correct names for certain animals.

These controversies over the years finally built up the triple-barreled problem of seeing that:

Light from some of the most distant extragalactic nebulae may have such a large shift that it would no longer fall in the visible range. It is such large shifts that astronomers hope to measure in the radio region.

No radio observations of receding galaxies are yet being made, however. The field of radio astronomy is so new that scientists are just learning to spot the various sources of radio noise. These include the moon, sun, meteors, hydrogen in interstellar space, and other sources both within and outside of our Milky Way galaxy.

Separation of these various sources from each other and from background radiation will be necessary in order to tell which radio waves are coming from the far distant extragalactic nebulae. To do so will involve a refinement both of present apparatus and techniques.

From the estimated distances of the receding galaxies and the speeds at which they are moving, astronomers believe that at some time in the past, all nebulae were quite close together. From then until now, the time required to give the present expansion is about 4,000,000,000 years. This is roughly equal to the known age of the earth, now believed to be about 3,500,000,000 years.

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there was a question as to what he was referring.

When the newly proposed changes go into effect, such a name for an animal may continue to be used even if an earlier name is dug up from the records. Thus, no Crangon-Alphaeus-Crago bewilderments will occur.

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MEDICINE

Doctors Told to Learn About Folk Cures

► **MODERN DOCTORS** should know something about patent medicines and such folk cures as "stump water," Drs. Lyle Saunders and Gordon W. Hewes of the University of Colorado advise in a report to the *Journal of Medical Education* (Sept.).

Since patients may consult 50 or more sources of medical advice and treatment other than licensed practitioners, the Colorado doctors think physicians should know about these, too, so as to be prepared to protect their patients from the harmful ones and correlate the harmless ones with the best of scientific medicine.

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GENERAL SCIENCE

When Is a Calorie 1,000 Times a Calorie?

► **WHAT IS** the difference between a calorie, a calorie and a calorie?

The question is not as silly as you may think. The calorie that dieting persons watch with so much apprehension is actually 1,000 times bigger than the calorie usually talked about in industry.

Technically, the calorie is a unit of heat. The small calorie is the amount of heat required to raise a gram of water one degree Centigrade, from 15 to 16 degrees. The small calorie is also called the "gram calorie" and the "standard calorie."

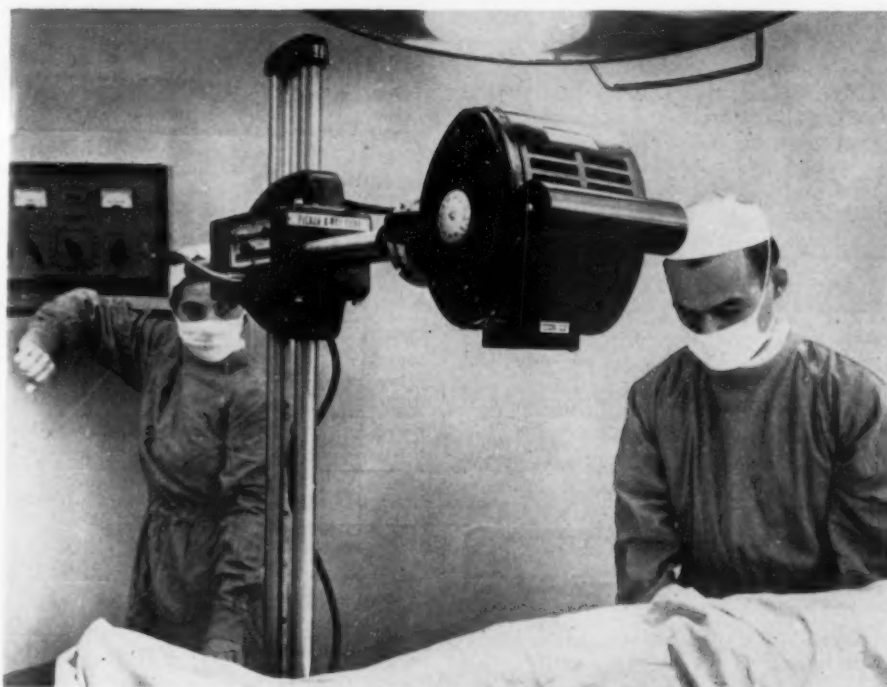
The calorie also can be the amount of heat necessary to raise a kilogram, 1,000 grams, of water from the 15th to the 16th degree on the Centigrade scale. This is the large calorie, sometimes called the "great calorie" or the "kilocalorie." This is the unit that applies to foods.

The third member of the calorie family is the "mean calorie." This is one one-hundredth of the heat required to raise one gram of water from zero to 100 degrees Centigrade.

A tasty bar of chocolate may contain 500 calories. When eaten and oxidized in bodily tissues, it releases that amount of energy to be used by the body.

When a person eats so much food that his body does not need all the calories it contains, the excess is stored as fat. Dieting persons eat somewhat less food than their bodies need. This causes the body to call upon its "food" reserve and thus to take off part of that waistline.

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X-RAYS IN OPERATING ROOM—Shown in action is the new Picker operating room X-ray unit, which is the first to win Underwriter Laboratories' approval as safe from explosion.

SURGERY

Explosion Proof Unit

► AN EXPLOSION proof X-ray unit for operating rooms, delivery rooms and anesthesia rooms was shown to doctors and hospital administrators at the meeting of the American Hospital Association in San Francisco.

The unit, said to be the first of its kind, was made by Picker X-ray Corporation of White Plains, N. Y.

Officially the unit is listed as safe for use in what are designated by the Underwriters' Laboratories as hazardous locations Class I, Group C, such as operating, delivery and anesthesia rooms, where high concentrations of combustible gases may be present.

The commonly used anesthetic gases, including ether, ethylene and cyclopropane, are all highly combustible. The technical problem of making a mobile X-ray unit safe from explosion has hitherto resisted solution because any housing strong enough to prevent the X-ray tube-head from exploding should gas enter it has to be so thick that X-rays cannot get out.

Picker engineers solved this dilemma by designing a safety device that makes the unit inoperable in the event that a leak in the normally sealed "head" should allow gas to enter.

The control panel is located separately from the mobile unit, and is permanently installed in the wall of the room five feet above floor level. This location is consid-

ered as safe because the anesthetic gases, being heavier than air, sink to the floor. This follows the practice approved, as well, by the National Fire Protection Association.

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MEDICINE

Doctors to Get Cancer Training via Color TV

► STARTING OCT. 21, doctors in five cities will get weekly lessons on cancer via color TV. The telecasts will last one hour and give the latest methods of detecting, diagnosing and treating cancer.

They will be beamed over a closed circuit linking medical centers in New York, Boston, Philadelphia, Pittsburgh, Detroit and Toledo. The series will run for 30 weeks. The American Cancer Society is putting on the program in cooperation with the Columbia Broadcasting System. The series establishes the following firsts:

First regular color network telecast series concentrating on one subject and presenting over a year a coordinated review of the latest information on a medical subject.

First time that a large screen—four-by-six feet and each screen accommodating 500 viewers—has been employed in an inter-city series of closed-circuit programs.

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ENGINEERING

High Voltage Lines Carry Hydropower

► SWEDISH ELECTRICAL engineers are transmitting great blocs of hydroelectric power at record high voltages from the far northern peninsula of that country to the heavily populated areas in the south.

B. G. Rathsmann and G. Jancke, both of the Swedish State Power Board at Stockholm, told the American Institute of Electrical Engineers meeting in Vancouver, B. C., that 400-kilovolt lines have been tried and found satisfactory for linking the hydroelectric stations with consumer areas 600 miles away.

The 600-mile stretch has been at work since April, 1952. Swedish engineers are planning for an ultimate 1,700-mile system by 1956.

Scarcity of coal and oil in the centers of population created similar localized scarcities of steam-generated electric power. The hydroelectric supplement helps fill the growing power demand.

Because of the electrical resistance in power lines, substantial power losses often must be endured in long-distance transmission. However, power losses drop sharply as the transmission voltage goes up.

Swedish engineers have met their problem by trying out 400-kilovolt transmission potentials. They have been the first to use this voltage satisfactorily. Previous attempts to use such high voltages have been beset by numerous insulation problems.

Science News Letter, September 12, 1953

INVENTION

Electricity-Conducting Glass Sandwich Patented

► AN ELECTRICITY-CONDUCTING glass sandwich that is fortified against operational failure has been patented. This may come as good news to the aircraft industry, which uses electrically heated glass in airplane windshields.

The safety glass invention involves two sheets of glass, one of which is coated with an electricity carrying film such as tin oxide. Sandwiched between the panes is a plastic filler separated from the glass panes by special tape or strip material located at the margins of the unit.

The special tape and strip material sharply cut chances of operational failure of the glass, report inventors Romey A. Gaiser and James H. Boicey, both of Toledo, Ohio. Thus when current flows through the conductive layer, the high temperature created there, contrasted with the "inside" room temperature and a possible sub-zero "outside" temperature, will not cause an electrode failure within the unit due to difference in expansion of the glass-sandwich elements.

The inventors assigned their patent, No. 2,650,976, to Libbey-Owens-Ford Glass Company, Toledo.

Science News Letter, September 12, 1953

NEUROLOGY

**"Pumps" Force Ions
Past Brain "Barriers"**

► A KEY factor in the operation of the central nervous system may be tiny, pump-like mechanisms which force vital substances through formidable "barriers" in the brain, it has been found by Dr. Robert Tschirgi of the University of California at Los Angeles Medical School. He is doing research on the brain under a U. S. Public Health Service grant.

Many substances carried by the blood are useful to other tissues, but harmful to sensitive, highly specialized brain cells. Brain cells are protected from these substances by difficult-to-penetrate barriers. For example, sodium ions, which go quickly from the blood into other body tissues, take 64 hours to penetrate brain tissue.

Pencillin, which is not toxic to other tissue, but is extremely toxic to the brain, readily penetrates other parts of the body but does not penetrate the brain.

"The brain is apparently assured of a carefully regulated quantitative and qualitative flow of substances necessary for its normal operation by a complex system of pumps," Dr. Tschirgi says. "Disorders of the nervous system such as epilepsy and cerebral palsy may occur when these pumps fail."

The most formidable barrier apparently exists between the brain blood vessels and the "moat" of cerebrospinal fluid that surrounds the central nervous system. This "moat" also serves as a reservoir of brain "fuel." Differences in the electrical potential between the blood and the cerebrospinal fluid indicate differences in the activity of the pumps that regulate the passage of soluble substances between the two fluids. These differences can be measured by sensitive instruments.

Science News Letter, September 12, 1953

MEDICINE

**Chlorophyll, House Calls,
Twins Are Medical News**

► RECENT MEDICAL news, according to the American Medical Association, concerns chlorophyll, house calls and twins.

The value of chlorophyll derivatives taken internally as deodorizing agents has not been determined, the association declared in an editorial in the *Journal of the American Medical Association* (Aug. 29).

Although some research has been done, "no final conclusions can be reached" until: the composition of the various preparations is more exactly spelled out; the fate of the swallowed chlorophylls in the body determined, and more objective testing done.

In one out of four cases a request to a doctor to make a house call is unwarranted because the patient is able to go to the doctor's office. Two out of three such calls are to treat women. This conclusion is drawn by Drs. William T. Couter, Alvin T. Held and Charles L. York of Decatur, Ill.

They base the conclusion on a study of 1,000 consecutive house calls made by them during two and one-half years.

Tuberculosis which had spread throughout their bodies and their generally weak condition made it impossible for doctors to separate Tasmanian Siamese twin girls who were joined at the top of their heads like the Brodie twins of Chicago. The girls were born in March, 1950, and died in January, 1951. They were barely able to stand a short, preliminary operation.

First detailed U. S. medical report of these twins is given by Dr. E. Graeme Robertson, honorary neurologist at the Royal Melbourne Hospital and Children's Hospital, Melbourne, Australia, in the *Archives of Neurology and Psychiatry*.

Science News Letter, September 12, 1953

SURGERY

**Instrument Spares
Operation on Patient**

► MANY CANCER patients whose cancers have spread to the liver and other organs in the abdomen can be spared useless operations by an instrument called the peritoneoscope, three doctors from the Veterans Administration Hospital at Des Moines, Iowa, report in the *Journal of the American Medical Association* (Aug. 22).

The three are Drs. Samuel J. Zoeckler, Philip G. Keil and George J. Hegstrom.

The peritoneoscope is an optical instrument equipped with lights and mirrors. It is inserted through a small cut into the abdomen. Peering through it, the doctor can see various small areas within the abdomen without having to perform the major operation of opening the entire abdomen, called laparotomy.

If he sees through the peritoneoscope a mass that might be cancer, he can remove a bit through the instrument with a forceps and this bit can be examined under the microscope for positive diagnosis.

If the cancer has spread so that it cannot be removed by operation, the patient is spared useless surgery. Over half, 51%, of patients have been spared such useless operations since the doctors started using the peritoneoscope as part of the routine study of those with suspected cancer. In addition, the instrument showed cancers that could be removed by operation in many of the patients.

Equally important, the doctors report, was the fact that in patients who had been operated on and returned to the hospital with various symptoms, peritoneoscope examination showed that 50% had more cancer but 27.8% did not. Probably most of these would, without the instrument examination, have been advised to have further operations.

Cancer was ruled out and other conditions shown as the cause of symptoms in 93% of a group of patients suspected of having cancers that could not be disproved by other means of diagnosis.

Science News Letter, September 12, 1953

IN SCIENCE

NEUROLOGY

**Better Nerve Surgery for
Blood Vessel Disorders**

► HOW TO get better results in nerve-cutting operations for relief of blood vessel disorders and high blood pressure was reported at the Ninth International Physiological Congress in Montreal by Drs. William J. Cox, Walter C. Randall, William Alexander, K. B. Coldwater and A. B. Hertzman of St. Louis University School of Medicine and the Veterans Hospital, Jefferson Barracks, Mo.

One object of the nerve-cutting operations is to free blood vessels from nervous control so that they will be more relaxed and permit blood to flow with less pressure from, and work by, the heart.

The conventional operation, when blood vessels in the legs or feet are affected, is to remove only the second and third lumbar ganglia (nerve cell mass). This sometimes fails to give the desired results and another operation must be done to remove other nerve cell masses near the spine.

The same situation exists in cases when the operation is done to relieve blood vessel disorder in the arms and hands.

The failures can be avoided, the St. Louis researchers suggest, by applying electrical stimulation to the nerves at the time of the operation, and measuring the sweating on the arms or legs, hands or feet. The action of blood vessels and sweating usually is controlled by the same nerves, so the sweating after nerve stimulation can serve as guide to which nerves should be cut to free the blood vessels.

However, the action of the blood vessels and sweat glands is not always tied together, so the scientists said the project must be pursued further on the basis of blood vessels alone in relation to the sympathetic nervous system.

Science News Letter, September 12, 1953

ASTRONOMY

**Mysterious Patches
Discovered on Sun**

► LARGE MYSTERIOUS patches have been spotted mathematically on the sun's visible surface, but they have not yet been identified with anything that can be seen. Such patches of granulation are spaced about 9,000 miles apart over the surface, Dr. J. H. Rush and F. E. Stuart of the High Altitude Observatory, Boulder, Colo., have found. They reported their evidence of these large patches to the American Astronomical Society meeting in that city.

Science News Letter, September 12, 1953

SCIENCE FIELDS

BIOCHEMISTRY

Vital Adrenal Glands Work Before Birth

► THE TINY but vital adrenal glands, famous because they produce the arthritis remedy, cortisone, and the heart stimulant, adrenalin, or epinephrine, start their work before birth. This is true, at least, for unborn lambs, reports Dr. S. R. M. Reynolds of the Carnegie Institution of Washington's department of embryology in Baltimore.

By producing adrenalin before birth, these glands may play a part in saving life threatened by pre-birth or birth asphyxiation, he reports in *Science* (Aug. 28).

Dr. Reynolds studied baby lambs delivered prematurely by Caesarean operation. When the heart and circulation of the animal is in a state of acute distress as a result of asphyxia and consequent oxygen lack, the time it takes the heart to recover is prolonged and its rate after recovery is less when the animal lacks adrenal glands.

Since, in the experiments, the heart had been freed from nervous system control, its recovery when the adrenals are not removed cannot be due to the nervous system stimulation. The slower recovery with the adrenals removed pointed to a stimulus from these glands. This, Dr. Reynolds says, could only be epinephrine or some other related substance from the adrenal glands.

Science News Letter, September 12, 1953

CHEMISTRY

Simplify Cortisone Production Method

► FIRST PROMISE of "unlimited supplies of cortisone," hormone famous for relief of arthritis and some other diseases, comes from a new, simplified method of producing the chemical, worked out by Monsanto Chemical Company, says its organic chemicals division research director, Howard K. Nason.

The Monsanto chemists responsible for this accomplishment, under the direction of Oliver J. Weinkauff, include William S. Knowles, Lloyd Barkley, Martin W. Farrar and Harold Raffelson.

Prof. Robert B. Woodward of Harvard University was the first to achieve a total synthesis of the saturated steroid nucleus, such as is found in cortisone. The Monsanto process starts with an inexpensive, plentiful material. It involves the discovery of new and more practical intermediates as well as the simplification of Woodward's procedure.

Specifically, the report in the *Journal of the American Chemical Society* describes

the synthesis of dl-cortisone acetate from an intermediate known as Woodward's tricyclic ketone in 17 steps, as compared with the 37 steps reported by Dr. Woodward. The process described by Monsanto does not require rare reagents and yields are reported as excellent.

Dr. Nason emphasized that the development by Monsanto does not mean that large quantities of totally synthetic cortisone will be available immediately. Some time will be required, he said, to translate the laboratory findings into full-scale plants capable of producing the synthetic hormone in commercial quantities.

Science News Letter, September 12, 1953

MARINE BIOLOGY

Potato-Like Sponges Fill Eastern Beaches

► STRANGE-LOOKING THINGS are being washed up on the East Coast beaches these days. They look like potatoes.

Some beachcombers thought they had found ambergris, the \$15-an-ounce stuff that comes out of sperm whales and is used in making perfume.

Dr. Jay D. Andrews, oyster biologist at the Virginia Fisheries Laboratory, however, found they are sponges.

The sponges were sanded over by the recent hurricane, Dr. Andrews believes. The strong waves during the storm probably dislodged them from their root-like attachment in the sand or mud where they grow. As they died and disintegrated, they floated to the surface and were washed up on the beaches.

Sponges grow all over oyster bars in Hampton Roads, many parts of Chesapeake Bay, and probably all along the Atlantic coast. Dr. Andrew's phones kept buzzing with calls from curious vacationists at nearby Virginia beaches, some confident of having found a fortune in ambergris.

Actually, if all that potato-like sponge cluttering up beaches in Virginia actually had been ambergris, the market would be flooded and the price would drop to a new low. Today's price varies from \$3 to \$15 per ounce, depending on the quality of the ambergris and on the demand in the perfume industry.

Science News Letter, September 12, 1953

EDUCATION

Need Desks to Match Bigger School Children

► TODAY'S SCHOOL children are bigger, as well as more numerous, than the school children of 50 years ago. They have outgrown the desks, seats and even coatracks that served their parents and grandparents. To help schools get the right sizes when they shop for new equipment, the U.S. Office of Education has just issued a handbook, "Basic Body Measurements of School Age Children" (see p. 172).

Science News Letter, September 12, 1953

ECOLOGY

Aussie Animals With Pockets Growing Smaller

► AUSTRALIA'S MARSUPIALS, those odd animals with pockets for their young which so charmed the GI's in World War II, are going through an evolutionary process of gradually getting smaller.

This is reported in *Nature* (Aug. 29) by Dr. Edmund D. Gill of the National Museum, Melbourne.

Dr. Gill found an upper molar tooth near Hamilton, Victoria, which he identified as having come from the mouth of a cuscus, prehistoric marsupial which lived there in the Upper Pliocene age. This brings to three the total of known Australian Tertiary marsupials. Others found previously were a kangaroo of the Lower Pliocene, older than the cuscus, and a possum of the Lower Miocene or Upper Eocene.

The series of three fossils show that the marsupials were small in the Tertiary. They were of giant size in the Pleistocene, when smaller forms also existed in smaller numbers. And they were small again in the following Holocene age. It is this process of getting smaller that is still going on today.

The bigger kangaroos are now tending to die out, while the small marsupials are thriving.

Science News Letter, September 12, 1953

ENGINEERING

Big Powerhouse to Serve New Aluminum Plant

► GIANT ELECTRICAL contacts on huge circuit breakers are scheduled to snap shut in April, 1954, putting the world's largest private hydroelectric plant "on the line."

Created in what is believed the largest underground powerhouse in the world, the electric power will be fed to the Aluminum Company of Canada's new aluminum reduction works 50 miles away at Kitimat, B.C.

The big power plant is situated on the Kemano River 500 miles from Vancouver and 185 miles from Prince Rupert. It ultimately will develop 2,400,000 horsepower for the aluminum company.

Powerful turbogenerators will be turned by water falling 2,585 feet to their blades. The water will be stored in a reservoir 125 miles long.

F. W. Lawton, power expert with Aluminum Laboratories Ltd., Montreal, told the American Institute of Electrical Engineers meeting in Vancouver, B.C., that the hydroelectric power will be transmitted to the smelting facilities at 300 kilovolts—an uncommonly high voltage. He said these will be the first 300 kv cables in North America.

The cables themselves are said to be unique: they consist of the world's largest steel-reinforced aluminum conductors.

Science News Letter, September 12, 1953

PSYCHOLOGY

New Tests Of Temperament

Soon it will not be necessary to guess what kind of person you are picking for a certain job. You will not have to try to tell a man's character from his expression or mannerisms.

By MARJORIE VAN DE WATER

► SINCE TIME immemorial men have been trying to size each other up by looking—at facial expressions, gestures, way of walking, mannerisms and other expressions of individual personality.

Now psychologists have found that you can learn of a man's temperament much better by finding out how he looks at his world rather than how he appears to his fellows.

New motto of psychologists is "Tell me what you see, and I will tell you what you are." Two men can look at exactly the same thing and each see something completely different.

You have all seen the "animated signs" that enliven the night along your own particular "Great White Way," and have been amused at the kitten playing with the balls of silk or the bathing girl diving into the water. You know, of course, that the figures on the signs do not actually move. The illusion is created by the successive lighting of series of colored light bulbs.

This same principle is now used in a movie that serves as an objective test of temperament. This movie shows colored spots of various shapes moving across a clock face. Successive frames show the spot of any given shape in successive positions moving across the clock face.

If you are following the round dot, for example, it appears to move from 8 o'clock to 2. The colors appear to flicker. But if you are paying attention to the red spot, it will appear to move from 2 o'clock to 8 and in this case the shape will flicker.

Distinguish Personality Traits

The fact that this simple color film test can actually show up the natural temperamental differences between different persons was discovered by Dr. L. L. Thurstone, psychologist, of the University of Chicago, who developed the film in research under contract with the United States Air Force Human Resources Research Center.

He found that here was an objective way to distinguish between the active, socially at ease, go-getter type of person who would make a good salesman and the man who is best at thinking things through quietly and might make a good scientist or philosopher.

Now it happens that the person who follows the form and does not pay attention to the color is one kind of individual. The person who follows the constant color and pays no particular attention to the shape is a quite different sort.

If you are one who naturally follows the form regardless of changing color, you are probably a person without striking emotional ups and downs. You like to be around other people and naturally take the lead in a group. You can devote yourself to handling matters as they are and do not plague yourself with imaginary fears and fancies. You are sure of yourself, and inclined to take strong action.

As a check on themselves, the psychologists planned the film so that the color procession would sometimes go up across the clock face instead of down. And the shape movement would take the opposite direction, too. This disclosed a very interesting fact. Some people always tend to see the movement as up regardless of whether it is a movement of form or color. Others see the down movement.

Those who follow movement up, characteristically, turned out to be somewhat like the form-dominant folk. They get

along well with people. They are emotionally stable and like to be the leader in a group. They are deliberate in their actions, cheerful and self-confident.

The ones who follow down movements tend to be timid and lacking in self-confidence. They are not active physically but like to sit and think alone. They do not, however, trust their own decisions.

Individuals who see the movement as going to the left, from 3 o'clock to 9, rather than from left to right, are likely to be independent. They talk freely and are happy with others. They like to lead.

Two Possible Interpretations

Those who see the movement toward the right are the quiet thinkers. They are not at all aggressive. If they want to persuade someone to do something, they would much rather sit down quietly and write a letter about it than they would to talk it over face to face. Such a person might be expected to feel at ease when he must spend long hours alone at the controls of an airplane cruising above the clouds.

When a person sits watching this film and he is asked in which direction the dots



WHAT IS IT?—Your answer to this question will show what is uppermost in your mind. Perhaps you will see it as an X-ray picture, Mickey Mouse, witches dancing in the wood or a cowboy, or you may see something that looks like an eye at the right. When you look at the picture in true focus on p. 175, do not be surprised that you did not know all the time.

appear to be moving, he usually answers immediately without hesitation. Apparently he sees only one movement and is quite unaware that an apparent movement may be seen in the other direction, too. However, if he keeps on watching the same film, the movement will seem to shift unaccountably to the opposite direction and later back again.

And if he is color blind, then he will naturally notice only the procession of form.

Devise Other Tests

This color film, although very promising, is only one of some 65 tests with which Dr. Thurstone has been experimenting. Another which he expects to construct and try out soon consists of a series of photographs. The first is printed badly out of focus. The person taking the test is asked to say what this fuzzy blob is a picture of. Each succeeding print is a little clearer than the last until the final one is in sharp focus.

It is believed that the speed with which a guess is made and the kind of object seen in the fuzzy picture may provide a good clue to personality.

This is a projective test like the well-known ink blot test, the Rorschach, but the scoring of it would be less dependent upon the personality of the examiner.

Another kind of test that is being tried is one of word association. This is similar to a test used to trip up criminals. In the examination of suspects, words are presented that are linked in some way to the scene of the crime, like "knife," "blood," or "bullet." The criminal betrays himself if his answer shows he is familiar with conditions at the scene, or if a delay in responding shows that he is trying to hide what has naturally come to his mind.

In the test as given by Dr. Thurstone, each word has several meanings. "Brass," for example, might be taken as meaning the metal or it might be thought of as "effrontery." The particular meaning seen in the different words will disclose something of the individual's character make-up, it is hoped.

Word Tests Tried

In another test, words are presented in pairs and the person taking the test is to indicate which word is stronger. Some of the pairs are emotionally neutral, as "colossal," and "large," while some are positive and some negative, emotionally. The supposition here is that the relative ease of identifying strength of meaning for the positive, negative, and neutral words will show up differences in temperament.

In every case, Dr. Thurstone is trying to keep the tests free from influence of the personality of the examiner.

Dr. Thurstone was not the first investigator to realize that concern with form or color was significant in distinguishing certain personality traits. Form dominance and color dominance are also important in the Rorschach ink blot test. In this test the individual looks at a series of blobs of ink

and tells what he sees in them. This is called a "projective" test because the blots are so ambiguous that the viewer sees in them only what he projects into them himself.

He sees the images that fill his own mind—his own fancy. What he sees, therefore, depends entirely upon what objects are foremost in his mind. The medical student is likely to see a drawing of human internal organs, the poet may see fairies dancing in a moonlit meadow, the individual who is mentally ill may see a pool of blood, a child may see a group kneeling down to play marbles, and so on.

The Rorschach test has been criticized by many psychologists because the results depend so much upon the professional skill or even the personality of the person who interprets them. Dr. Thurstone says, "The interpretations of the scores seem to be as projective for the examiner as for the subject."

Science News Letter, September 12, 1953

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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ABOUT BOOKS AND CHILDREN: Historical Survey of Children's Literature—Bess Porter Adams—*Holt*, 573 p., illus., \$6.00. To acquaint parents and teachers with the story-book world in which children spend many of their waking hours.

AMERICAN SCHOLARSHIP IN THE TWENTIETH CENTURY—Merle Curti, Ed.—*Harvard University Press*, 252 p., \$4.50. A cooperative endeavor reviewing the achievements of American scholarship in the last 50 years, and their relations to each other and to American life. Six distinguished authors have taken part in the work.

BASIC BODY MEASUREMENTS OF SCHOOL AGE CHILDREN: A Handbook for School Officials, Architects, and Design Engineers in Planning School Buildings, Furniture and Equipment—W. Edgar Martin—*U. S. Office of Education*, 74 p., illus., paper, single copies free upon request direct to publisher, Washington 25, D. C. Useful to all concerned with the sizes of children of various ages. (See p. 169.)

THE BIG 3 AND 1 MORE MAKES 4—Andrew J. White—*Motor Vehicle Research*, 64 p., illus., paper, \$2.00. Describing exhaustive tests on Plymouth, Ford, Chevrolet and Willys automobiles.

BUSINESS PLANNING IN A CHANGING WORLD—Lewis E. Lloyd and others—*American Management Association*, 51 p., illus., paper, \$1.25. How and why you should make future plans for your business.

CLINICAL SONNETS—Merrill Moore—*Twayne*, ed., 71 p., illus., \$2.75. A psychiatrist-poet gives us extraordinary, revealing glimpses into the souls of ordinary people. The pen and ink sketches will add to your enjoyment of these sonnets.

COMPANY PRACTICES IN MARKETING RESEARCH—Richard D. Crisp—*American Management Association*, 63 p., paper, \$2.50. Results of a survey of companies of various sizes conducted in the summer of 1952, supplemented with background material helpful in interpreting them.

THE CHEMISTRY WE USE: Experiments For the Home Lab—Burton L. Hawk—*Science Service*, 87 p., illus., \$2.00. About the chemistry of things most of us just take for granted—air, food, water, clothing, etc.

A COMPREHENSIVE AGRICULTURAL PROGRAM FOR PUERTO RICO—Nathan Koenig—*Govt. Printing Office*, 299 p., illus., paper, \$1.75. A study of the problems of people and their land in an area where both people and land have long been underemployed and undernourished.

DIRECTIONAL CHANNELIZATION AND DETERMINATION OF PAVEMENT WIDTHS—Eugene Maier, Chairman—*National Academy of Sciences-National Research Council*, Highway Research Board Bulletin 72, 49 p., illus., paper, 75 cents. Discussion of highway designs intended to relieve congestion and prevent accidents.

FATIGUE OF METALS—R. Cazaud—*Philosophical Library*, 334 p., illus., \$12.50. In compiling this book, the author has used only those results that have been obtained with completely defined metals and alloys under known conditions of test.

15TH ANNUAL REPORT FOR THE YEAR ENDED DECEMBER THIRTY-FIRST 1952—Basil O'Connor, president—*National Foundation for Infantile Paralysis*, 96 p., illus., paper, free upon request direct to publisher, 120 Broadway, New York 5, N. Y. Appealing photographs add to the human interest of this story.

GEOLOGICAL INVESTIGATIONS OF STRONTIUM DEPOSITS IN SOUTHERN CALIFORNIA—Cordell Durrell—*California Division of Mines*, Special Report 32, 48 p., illus., paper, \$1.25. Giving the location, with maps, of the deposits and describing them.

GLACIER VARIATIONS AND CLIMATIC FLUCTUATIONS—H. W. Son Ahlmann—*American Geographical Society*, 51 p., illus., \$2.50. The author was for three years president of the Commission on Snow and Ice of the International Association of Hydrology.

THE GREEN AND RED PLANET: A Physiological Study of the Possibility of Life on Mars—Hubert Strughold—*University of New Mexico Press*, 107 p., illus., \$4.00. For those who like to speculate on the chances of life on Mars, here is a physiologist's contribution.

LETTERS ON ART AND LITERATURE—Francois Mauriac—*Philosophical Library*, 120 p., \$3.00.

A French Catholic writer here expresses informally his thoughts on a variety of subjects.

MAKING THE MOST OF YOUR HUMAN RESOURCES—Matthew Radom and others—*American Management Association*, 76 p., paper, \$1.25. Papers devoted to the problem of making the best use of personnel.

MAN ON HIS NATURE—Sir Charles Sherrington—*Doubleday Anchor*, 2d ed., 316 p., paper, 85 cents. An inexpensive edition of a book originally published in 1951. Concerned mainly with human consciousness.

THE MAYFLIES, OR EPHEMEROPTERA, OF ILLINOIS—B. D. Burks—*Natural History Survey*, 216 p., illus., paper, free to individuals upon request direct to publisher, Natural Resources Building, Urbana, Ill. There are over 550 different species of mayflies known for North America north of Mexico. This report includes 48 genera and 222 species.

MAY'S MANUAL OF THE DISEASES OF THE EYE: For Students and General Practitioners—Charles A. Perera—*Williams and Wilkins*, 21st ed., 512 p., illus., \$6.00. A compact and exact guide to all the diseases of the eye.

MECHANISM OF CORTICOSTEROID ACTION IN DISEASE PROCESSES—Oscar Hechter and Gregory Pincus and others—*New York Academy of Sciences*, 192 p., illus., paper, \$3.50. Papers contributed by men intensively engaged in the biochemical and physiological investigations in the field.

MORE CLINICAL SONNETS—Merrill Moore—*Twayne*, 72 p., illus., \$3.00. The warning label on the jacket, "Warning: May Be Habit-Forming," should be placed on every one of these delightful books of sonnets. Dr. Moore, a psychiatrist, has a way of distilling into 14 lines the essence of his patients' souls.

MOST-OFTEN-NEEDED 1953 RADIO DIAGRAMS AND SERVICING INFORMATION—M. N. Beitman—*Supreme*, 192 p., illus., paper, \$2.50. Here you will find what you need to service recent radio sets, including FM and AM, auto radios, portables, and sets using printed circuits.

NEW SCREEN TECHNIQUES—Martin Quigley, Jr., Ed.—*Quigley Pub. Co.*, 208 p., illus., \$4.50. Discussing three new motion picture techniques: 3-D pictures, wide screen pictures and stereophonic sound.

POTSDAM: An Introduction to the Study of Prehistoric Southwestern Ceramics and Their Use in Historic Reconstruction—Harold S. Colton—*Northern Arizona Society of Science and Art*, 86 p., illus., \$3.00. What our forefathers threw away as junk is now carefully sorted and studied by archaeologists who wring from this source the story of life in ancient times.

PROFITABLY USING THE GENERAL STAFF POSITION IN BUSINESS—Lyndall F. Urwick and Ernest Dale—*American Management Association*, 35 p., illus., paper, \$1.25. Since the days of ancient Egypt, the general staff has aided the commander of armies. Here is shown how the same idea can be applied to the working of industry.

A REFRESHER COURSE IN MATHEMATICS—F. J. Camm—*Emerson*, 240 p., \$2.95. Intended for those who have previously mastered the subject but have forgotten fundamental fact, but it can also be used by those new to the field.



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SCIENTIFIC CAR TESTING: Highway Laboratory on Wheels—Andrew J. White—*Motor Vehicle Research*, 72 p., illus., paper, \$2.00. Telling what it takes to give you accurate scientific information about the capabilities and shortcomings of the car you buy.

SOIL TEMPERATURE AND GROUND FREEZING: James F. Haley and others—*National Academy of Sciences-National Research Council*, Highway Research Board Bulletin 71, 124 p., illus., paper, \$1.80. Reports of studies in the laboratory and in practical situations.

THEORETICAL ANTHROPOLOGY: David Bidney—*Columbia University Press*, 506 p., \$8.50. For advanced students of anthropology, this book is the product of a decade of research in the interdisciplinary field of cultural anthropology and social philosophy. The author is best known as a philosopher.

WHAT'S INSIDE THE EARTH?:—Herbert S. Zim—*Morrow*, 32 p., illus., \$1.75. A picture book from which parents as well as children can learn something of the structure of the earth on which we walk.

Science News Letter, September 12, 1953

ENTOMOLOGY

Praying Mantis Preys on Insects

See Front Cover

► **ENDOWED BY** nature with a voracious carnivorous appetite, the praying mantis will devour everything from the carcasses of dead field mice to hummingbirds, if it can catch them. Its preferred diet, however, consists of other insects, smaller than himself.

About this time of year, when the mantises come in season, people often consider rearing these cannibals as insect-destroyers. There is, however, a drawback to this idea. The mantis will eat all kinds of insects, and among them, those that do a much better job of eating insect pests than the mantis itself does.

The praying mantis shown on the cover of this week's SCIENCE NEWS LETTER is a young one, as indicated by short wing pads. Mature individuals of the species, *Tenodera*, have long wings that cover the abdomen.

Science News Letter, September 12, 1953

YOUR HAIR

Its Health, Beauty and Growth
By Herman Goodman, M.D.

A medical specialist tells you what to do to save and beautify your hair, stimulate healthier hair growth, and deal with many problems, as: Dandruff—gray hair—thinning hair—care of the scalp—baldness—abnormal types of hair—excessive oiliness—brittle dryness—hair falling out—infection—parasites—hair hygiene—glands—diet—coloring—and myriad other subjects concerning hair.

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MEDICINE

Discover New Virus Which May Be Polio

► A **NEW** virus that may turn out to be a fourth type of polio virus has been discovered by Drs. Alex J. Steigman and U. Pentti Kokko and Miss Rosalie J. Silverberg of the Kentucky Child Health Foundation Research Laboratory and the University of Louisville.

They call it Kentucky virus.

The new virus was recovered from the spinal cord of a child who died of true poliomyelitis in the 1952 epidemic. It is not related to the three standard types of polio virus.

The fact that it was in such a deep structure as the spinal cord suggests that it may be a polio virus and the cause of the disease that killed the child. This will not be known until further study has been made.

Meanwhile the Kentucky scientists have reported the new virus to the *Journal of the American Medical Association* (July 11) so that scientists during the current polio season will inspect spinal cord material from persons who die of the disease. If a hitherto unrecognized type of polio virus exists, it would be important to know that during epidemics and in connection with development of a vaccine against the disease.

Science News Letter, September 12, 1953

SOCIOLOGY

Spend Time in Prison To Study Embezzlement

► A **SOCIOLOGIST** has scientifically studied the problem of embezzlement—swiping the boss's money—and decided that it results from three factors:

1. The development of a financial problem which the embezzler does not feel he can share with anyone.
2. The perception that access to other people's money presents a possible solution to the problem.
3. The rationalization of pseudo-legitimate ground for misusing the money.

The sociologist is Dr. Donald Cressey of the University of California at Los Angeles, who has spent several years studying embezzlement case histories. His research took him into the Illinois State Prison, Joliet, Ill., the United States Penitentiary at Terre Haute, Ind., and the California Institute for Men at Chino, Calif.

How can embezzlement be checked?

"Provision for company counselors who know employees intimately might prevent many non-sharable problems from arising," Dr. Cressey says. "Or educational programs might condition employees with such problems to avoid rationalizations so that 'borrowing' becomes synonymous with 'stealing.' The latter program is based on the fact that most embezzlers do not want to identify themselves with criminal activity."

Science News Letter, September 12, 1953

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DENTISTRY

False Teeth Better When Magnetized

► FALSE TEETH that stay in place and work efficiently even when chewing peanut butter sandwiches are reported by Dr. Hyman Freedman of New York in the *Journal of the American Dental Association* (Sept.).

Secret of the stability of these dentures, as dentists call them, lies in small magnets put in just the right place in upper and lower sets. Because the magnets have like poles, they repel each other, Dr. Freedman explains. As a result, each time the teeth are closed for chewing, they are gently settled.

Satisfactory use of "hundreds" of such sets of false teeth over a period of years is reported by Dr. Freedman.

Science News Letter, September 12, 1953

Fires have cost the nation \$1,000,000,000 and 10,000 lives in the past year.



Sells Several Stories as Result of Training

"N.I.A. training helped me to make several sales since I embarked on full-time free-lancing. The latest entitled, 'Cabin Pressurization,' was published in *Aviation and Yachting Magazine*."—Henry S. Galus, 164 Cedar Grove, New Bedford, Mass.

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PALEONTOLOGY

NATURE RAMBLINGS



Thermosthanatos

► DINOSAURS DIED off leaving no heirs of their line to dispute with the upstart mammals their once-held dominion of the earth, not because the climate became too cold but because it got too hot for them.

The heat may have killed some of them directly, but more likely it wrought their extinction indirectly, through making the males incapable of reproduction.

This thesis, radically contradictory to the older doctrine that the great reptiles were simply frozen out by some long-gone ice age, is advanced by Prof. Raymond R. Cowles of the University of California at Los Angeles. He has devoted a good deal of research to the phenomena of heat-responses in modern cold-blooded animals, especially reptiles, and he reasons by analogy with what he has actually observed under field conditions.

Years ago, Prof. Cowles came to question the time-worn simile, "happy as a lizard on a hot rock," because the lizards he had seen on hot rocks were distinctly not happy. To begin with, lizards (or snakes) are rarely seen on rocks that are really hot.

Few reptiles are to be seen in the full glare of the noonday sun in the desert. They are down in their burrows, or hiding in shady spots. The time for them to be abroad is in the forenoon and late afternoon, when the sand and rocks are merely pleasantly warm.

The California zoologist went beyond simple field observations. He penned reptiles of various kinds on areas of rock and sand and kept them there as daytime temperatures rose to their simmering maxima. The poor creatures showed signs of increasing distress, ending in prostration. If he did not let them escape in time, they died.

The point is that these so-called cold-blooded animals become more hot-blooded than warm-blooded animals when they are exposed to too much heat. They do not have the thermo-regulatory mechanisms possessed by the later-arriving, more highly evolved mammals and birds. If the hot rock changes from a nice, warm basking-place to a 120-degree griddle, they die of what amounts to an extreme fever.

Even without waiting for that, however, a male reptile, with its sex glands carried within its over-heated body, can suffer heat-sterilization if caught by a too-high temperature. Crocodilians and sea-turtles keep safely cool in the water; terrestrial snakes and lizards are small enough to find saving shelter. But the huge, lumbering saurians of the late Cretaceous, kept constantly just a little too warm by an endless August of world-wide tropical conditions, may very well have become incapable of fertilizing their mates' eggs.

So, like many another ponderous aristocracy, they may well have lost their world simply through lack of offspring.

Science News Letter, September 12, 1953

MEDICINE

TB Vaccine Tested

► A NEW vaccine against tuberculosis is undergoing tests at the University of Bristol. Results so far in tests with guinea pigs show that it is as good as the B.C.G. vaccine now widely used to give humans protection.

These results and the method of making the vaccine are reported by Dr. C. N. Iland in *Lancet* (Aug. 8).

The new vaccine is made from virulent human tuberculosis germs killed by treatment with urea, a nitrogen-containing compound made in the body by decomposition of proteins, and also produced synthetically. The urea can be removed from the vaccine without destroying the vaccine's protective power.

The vaccine was made to avoid certain disadvantages of B.C.G. These disadvantages are lack of stability and preparation

from a living, though weakened, strain of TB germs. These weakened germs, Dr. Iland points out, may differ in ability to give protection against virulent tuberculosis germs.

The urea kills the tuberculosis germs and also other germs, thus acting as a preserving and sterilizing agent for the vaccine.

When the urea-killed germ vaccine, or u.k.v. for short, was given to guinea pigs, they showed no signs of tuberculosis. After a year the animals were sacrificed and the bodies examined. There was no sign of tuberculosis infection.

Further tests were made by vaccinating guinea pigs and then giving doses of virulent human tuberculosis germs. In these, the u.k.v. vaccine showed itself as good as but no better than B.C.G.

Science News Letter, September 12, 1953



TEMPERAMENT TEST IN FOCUS—This is the in-focus print of the photograph shown on page 170. For camera fans, the picture on this page is made first. Then the bellows of the enlarger is extended to throw the image out of focus for the test print.

RADIO ASTRONOMY

Collisions of Galaxies

► **GIGANTIC COLLISIONS** of galaxies may cause the powerful radio waves reaching earth from outer space. Such galactic clashes result in violent motion of the tenuous gas between the stars.

Dr. Fred Hoyle of St. John's College, Cambridge, Eng., working temporarily at the Dominion Astrophysical Observatory, Victoria, B. C., upholds this theory of the origin of cosmic noise.

Drs. Walter Baade and Rudolph L. Minkowski of the Mount Palomar Observatory, Calif., have recently discovered in Cygnus,

the swan, one source of radio noise from outer space that appears to be two galaxies in collision. While the stars of one galaxy are passing between the stars of the other, the extremely thin gas between them must be stirred up into very violent motion, thus generating the powerful radio waves.

The two galaxies are rushing at each other at a velocity of perhaps 1,800 miles per second, Dr. Hoyle believes. Such a very high velocity probably means that the ions, or electrically charged particles of which the neutral gas is composed, have a high temperature. It is this high electron temperature, Dr. Hoyle says in *Nature* (Aug. 15), that causes the radio wave radiation.

The two galaxies in collision are surrounded by a great gas cloud, perhaps 200,000 million million miles across at an electron temperature of 100,000,000 degrees absolute. Radiation from such a source, Dr. Hoyle calculates, would be at least as intense as that which has been found coming from the source in Cygnus. Such radiation would be sufficient to be detected even if the source were so far away that it was beyond the range of the greatest optical telescopes.

The rate of radiation is very much increased because the electrically charged particles are not found evenly distributed, but

are separated somewhat according to their charges. This separation of charge is due to the slight magnetic field.

Dr. Hoyle's theory would also apply to the sources of radio noise in Cassiopeia and the Crab nebula.

Science News Letter, September 12, 1953

QUESTIONS

GENERAL SCIENCE—What are three definitions of a calorie? p. 166.

MEDICINE—Why should doctors learn about folk cures? p. 166.

PSYCHOLOGY—How can what you see tell what you are? p. 170.

PUBLIC SAFETY—What are the objections to use of "bug" deflectors? p. 164.

SURGERY—How can cancer patients be spared useless operations? p. 168.

Photographs: Cover, pp. 170 and 175, Fremont Davis; p. 163, U. S. Air Force; p. 165, Sperry Gyroscope Co.; p. 167, Picker X-Ray Corporation; p. 176, Semco Research, Inc.

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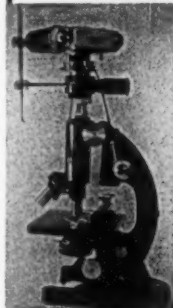
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Science News Letter, September 12, 1953

✿ **DACRON-FILLED PILLOW** is stuffed with the resilient supersoft polyester fiber that does not become lumpy or matted after long, hard use. The manufacturer reports the pillow's filling does not produce allergies.

Science News Letter, September 12, 1953

✿ **"UNIVERSAL" OPENER** is just the right weapon to use against the "bewildering army of bottle closures now at hand." Made of heavily chromed tool steel, the device unscrews large bottle tops, cracks nuts, pierces fruit juice cans, acts as a cork screw and screw driver, cuts celluloid cap covers and cracks small parts of a lobster.

Science News Letter, September 12, 1953

✿ **PILOT'S KNEE** board is equipped with two pencil storage compartments, a coil-spring pencil rest and a built-in pencil



sharpener. Chart cards are held firmly in place by an upper and lower spring clip, and another compartment holds the pilot's identification. The durable device, shown in the photograph, weighs nine ounces, and can be strapped to the knee.

Science News Letter, September 12, 1953

✿ **HEAT-RESISTING MATERIAL** can be sprayed directly on clean, unprimed metals to make the treated surface capable of withstanding temperatures as high as 5,000 degrees Fahrenheit. A coating of one-sixteenth of an inch protects metal up to 10 seconds against flames hotter than the metal's melting point. The substance dries quickly and is not easily chipped.

Science News Letter, September 12, 1953

✿ **SMOKER'S PIPE** has two bowls, both filled with tobacco. The second bowl filters the smoke from the first, yielding a cool smoke. Special flavors or aromas can be produced if a menthol crystal or a few drops of rum are added to the filtering tobacco. Made of well-seasoned imported briar, the pipe is designed so that both bowls can be cleaned at once.

Science News Letter, September 12, 1953

✿ **CANNED ICE** provides a novel way of refrigerating picnic lunches or soft drinks without the disadvantages of melting ice. The specially prepared can is frozen in a refrigerator's freezing unit, and is said to keep food and drink cold for 72 hours in a picnic box. One can is equivalent to three pounds of ice. The device can be used over and over.

Science News Letter, September 12, 1953

✿ **STAIN REMOVER** for plastic dishes now is available for use in the home, having been proved industrially for several years. The cleaner effectively removes coffee, fruit and other food stains without damaging the cleansed articles. It also soaks out most food and fruit stains from color-fast fabrics without damaging the fibers, the maker reports.

Science News Letter, September 12, 1953

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Do You Know?

The first world-wide cable code to be used in transmitting news of epidemics and quarantines was recently announced.

Chinese make up 44% of Malaya's population.

Losses to farmers caused by pests last year amounted to \$12,000,000,000.

Fire, insects and disease have destroyed, in the past 350 years, about 40% of America's virgin and planted forests.

Thorium 230, valuable in the atomic energy program, has been isolated from deep sea sediments.